A1 cont.

66. A compound comprising at least one increased binding energy hydrogen atom having a binding energy of about $13.6/n^2$ eV, wherein n is a fraction whose numerator is 1 and denominator is an integer greater than 1 and at least one other element.

67. A compound comprising at least one increased binding energy hydrogen molecule having a first binding energy of about $15.5/n^2$ eV, wherein n is a fraction whose numerator is 1 and denominator is an integer greater than 1 and at least one other element.

68. A compound comprising at least one increased binding energy molecular hydrogen ion having a first binding energy of about $16.4/n^2$ eV, wherein n is a fraction whose numerator is 1 and denominator is an integer greater than 1, and at least one other element.

69. A compound comprising at least one hydride ion having a binding energy of about 0.65 eV and at least one other element.

70. A compound containing at least one hydride ion formulated from at least one hydrino atom and at least one other element.

71. A compound according to any one of claims 65 to 70, wherein the compound further comprises one or more cations.

72. A compound according to claim 71, wherein the cation is a proton.

73. A compound according to claim 71, wherein the cation is the ion $H_3^+$.

74. A compound according to any one of claims 65 to 70, wherein said at least one

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other element comprises at least one selected from the group consisting of ions and compounds containing an increased binding energy species.

A\ cont.

75. A compound according to any one of claims 65 to 70, wherein the compound further comprises one or more normal hydrogen atoms.

76. A compound according to any one of claims 65 to 70, wherein the compound further comprises one or more normal hydrogen molecules.

77. A compound according to any one of claims 65 to 70, wherein the compound has a formula selected from the group of formulae consisting of MH, $MH_2$, and $M_2H_2$ wherein M is an alkali cation and H is selected from the group consisting of increased binding energy hydride ions, hydrino atoms and dihydrino molecules.

78. A compound according to any one of claims 65-70, wherein the compound has the formula $MH_n$ wherein n is 1 or 2, M is an alkaline earth cation and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

79. A compound according to any one of claims 65 to 70, wherein the compound has the formula MHX wherein M is an alkali cation, X is one of a neutral atom, a molecule, or a singly negatively charged anion, and H is elected from the group consisting of increased binding energy hydride ions and hydrino atoms.

80. A compound according to any one of claims 65 to 70, wherein the compound has the formula MHX wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

81. A compound according to any one of claims 65 to 70, wherein the compound has

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the formula MHX wherein M is an alkaline earth cation, X is a doubly negatively charged anion, and H is a hydrino atom.

A1 cont.

82. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2HX$ wherein M is an alkali cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

83. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MH_n$ wherein n is an integer from 1 to 5, M is an alkali cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

84. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2H_n$ wherein n is an integer from 1 to 4, M is an alkaline earth cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

85. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2XH_n$ wherein n is an integer from 1 to 3, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

86. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2X_2H_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

87. A compound according to any one of claims 65 to 70, wherein the compound has

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the formula $M_2X_3H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

A1 cont.

88. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2XH_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

89. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2XX'H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, X' is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

90. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MM'H_n$ wherein n is and integer from 1 to 3, M is an alkaline earth cation, M' is an alkali metal cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

91. A compound according to any one of claims 65 to 70, wherein the compound is $MM'XH_n$ wherein n is 1 to 2, M is an alkaline earth cation, M' is an alkali metal cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

92. A compound according to any one of claims 65 to 70, wherein the compound is MM'XH where M is an alkaline earth cation, M' is an alkali metal cation, X is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

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A1 cont.

93. A compound according to any one of claims 65 to 70, wherein the compound has the formula MM'XX'H where M is an alkaline earth cation, M' is an alkali metal cation, X and X' are each a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

94. A compound according to any one of claims 65 to 70, wherein the compound has the formula $H_nS$ wherein n is 1 or 2, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

95. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MSiH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

96. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MXM'H_n$ wherein

n is an integer from 1 to 5;

M is an alkali or alkaline earth cation;

X is a singly negatively charged anion or a doubly negatively charged anion;

M' is selected from the group consisting of Si, Al, Ni, the transition elements, the inner transition elements, and the rare earth elements; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

97. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MAlH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

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98. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MH_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of the transition elements, the inner transition elements, and the rare earth element cations and nickel; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

A1 cont.

99. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MNiH_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

100. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MM'H_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum;

M' is selected from the group consisting of the transition elements, the inner transition elements, and rare earth element cations; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

101. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding

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energy hydrogen species.

A1 cont.

102. A compound according to any one of claims 65 to 70, wherein the compound has the formula $Si_2H_n$ wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

103. A compound according to any one of claims 65 to 70, wherein the compound has the formula $SiH_n$ wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

104. A compound according to any one of claims 65 to 70, wherein the compound has the formula $TiH_n$ wherein n is an integer from 1 to 4, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

105. A compound according to any one of claims 65 to 70, wherein the compound has the formula $Al_2H_n$ wherein n is an integer from 1 to 4 and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

106. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MXAlX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

107. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MXSiX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

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A1 cont.

108. A compound according to any one of claims 65 to 70, wherein the compound has the formula $SiO_2H_n$ wherein n is an integer from 1 to 6 and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

109. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MSiO_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

110. A compound according to any one of claims 65 to 70, wherein the compound has the formula $MSi_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

111. A compound according to any one of claims 65 to 70, wherein the compound has the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

112. A compound according to claim 79, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

113. A compound according to claim 80, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

114. A compound according to claim 82, wherein said singly negatively charged anion

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is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

A1 cont.

115. A compound according to claim 85, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

116. A compound according to claim 86, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

117. A compound according to claim 87, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

118. A compound according to claim 89, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

119. A compound according to claim 91, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

120. A compound according to claim 93, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

121. A compound according to claim 96, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen

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carbonate ions, and nitrate ions.

A1 cont.

122. A compound according to claim 106, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

123. A compound according to claim 107, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

124. A compound according to claim 81, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

125. A compound according to claim 88, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

126. A compound according to claim 89, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

127. A compound according to claim 92, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

128. A compound according to claim 96, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

129. A compound according to claim 106, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

130. A compound according to claim 107, wherein said doubly negatively charged anion

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is selected from the group consisting of carbonate ions and sulfate ions.

A1 cont.

131. A compound according to any one of claims 65 to 70, wherein the compound is greater that 50 atomic percent pure.

132. A compound according to any one of claims 65 to 70, wherein the compound is greater that 90 atomic percent pure.

133. A compound according to any one of claims 65 to 70, wherein said at least one other element comprises at least one selected from the group consisting of a proton, ordinary hydrogen atom, ordinary hydrogen molecules, ordinary hydrogen molecular ions and ordinary $H_3^+$.

134. A compound according to any one of claims 65 to 70, wherein said at least one other element comprises at least one element selected from the group consisting of alkaline earth metals and alkali metals.

135. A compound according to any one of claims 65 to 70, wherein said at least one other element comprises at least one element selected from the group consisting of organic compounds.

136. A compound according to any one of claims 65 to 70, wherein said at least one other element comprises at least one element selected from the group consisting of semiconductors.

137. A compound comprising:

(a) at least one neutral, positive or negative increased binding energy hydrogen species having a binding energy:

(i) greater than the binding energy of the corresponding ordinary

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A1 cont.

hydrogen species, or

(ii) greater than the binding energy of any hydrogen species for which the corresponding ordinary hydrogen species is unstable or is not observed because the ordinary hydrogen species' binding energy is less than thermal energies at ambient conditions, or is negative; and

(b) at least one other element, wherein said increased binding energy hydrogen species is selected from the group consisting of $H_n$, $H_n^-$, and $H_n^+$, where n is an integer of 1 to 8, and n is greater than 1 when H has a positive charge.

138. A compound according to claim 137, wherein said increased binding energy hydrogen species is selected from the group consisting of (a) a hydride ion having a binding energy greater than the binding energy of the corresponding ordinary hydride ion for p = 2 up to 23 in which the binding energy is represented by

T1400X

$$Binding\ Energy = \frac{\hbar^2\sqrt{s(s+1)}}{8\mu_e a_0^2\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^2} - \frac{\pi\mu_0 e^2\hbar^2}{m_e^2 a_0^3}\left(1+\frac{2^2}{\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^3}\right)$$

where p is an integer greater than 1, s = ½, ħ is Plank's constant bar, $\mu_0$ is the permeability of vacuum, $m_e$ is the mass of the electron, $\mu_e$ is the reduced electron mass, $a_0$ is the Bohr radius, and *e* is the elementary charge; (b) hydrogen atom having a binding energy greater than about 13.6 eV; (c) hydrogen molecule having a first binding energy greater than about 15.5 eV; and (d) molecular hydrogen ion having a binding energy greater than about 16.4 eV.

139. A compound according to claim 137, wherein the increased binding energy species is hydride ion having a binding energy of about 3.0, 6.6, 11.2, 16.7, 22.8 29.3, 36.1, 42.8, 49.4, 55.5, 61.0, 65.6, 69.2, 71.53, 72.4, 71.54, 68.8, 64.0, 56.8, 47.1, 34.6,

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of 19.2.

A' cont.

140. A compound according to claim 137, wherein said increased binding energy hydrogen species is a hydride ion having a binding energy greater than the binding energy of the corresponding ordinary hydride ion for p = 2 up to 23 in which the binding energy is represented by

T1410X

$$\text{Binding Energy} = \frac{\hbar^2\sqrt{s(s+1)}}{8\mu_e a_0^2\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^2} - \frac{\pi\mu_0 e^2\hbar^2}{m_e^2 a_0^3}\left(1+\frac{2^2}{\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^3}\right)$$

where p is an integer greater than 1, s = ½, ħ is Plank's constant bar, $\mu_0$ is the permeability of vacuum, $m_e$ is the mass of the electron, $\mu_e$ is the reduced electron mass, $a_0$ is the Bohr radius, and $e$ is the elementary charge.

141. A compound according to claim 137, wherein said increased binding energy hydrogen species is selected from the group consisting of (a) a hydrino atom having a binding energy of about 13.6 eV/$(1/p)^2$, where p is an integer greater than 1; (b) a hydride ion having a binding energy represented by

T1411X

$$\text{Binding Energy} = \frac{\hbar^2\sqrt{s(s+1)}}{8\mu_e a_0^2\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^2} - \frac{\pi\mu_0 e^2\hbar^2}{m_e^2 a_0^3}\left(1+\frac{2^2}{\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^3}\right)$$

where p is an integer greater than 1, s = ½, ħ is Plank's constant bar, $\mu_0$ is the permeability of vacuum, $m_e$ is the mass of the electron, $\mu_e$ is the reduced electron mass, $a_0$ is the Bohr radius, and $e$ is the elementary charge; (c) a trihydrino molecular ion, $H_3^+$ (1/p), having a binding energy of about $22.6/(1/p)^2$ eV; (d) an

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increased binding energy hydrogen molecule having a binding energy of about $15.5/(1/p)^2$ eV; and (e) an increased binding energy hydrogen molecular ion with a binding energy of about $16.4/(1/p)^2$ eV.

A1 cont.

142. A compound according to claim 141, wherein p is 2 to 200.

143. A compound according to claim 137, wherein the compound is greater that 50 atomic percent pure.

144. A compound according to claim 137, wherein the compound is greater that 90 atomic percent pure.

145. A compound according to claim 137, wherein said increased binding energy hydrogen species is negative.

146. A compound according to claim 145, further comprising at least one cation.

147. A compound according to claim 146, wherein said cation is a proton, $H_2^+$ or $H_3^+$.

148. A compound according to claim 137, wherein said at least one other element comprises at least one selected from the group consisting of a proton, ordinary hydrogen atom, ordinary hydrogen molecules, ordinary hydrogen molecular ions and ordinary $H_3$+.

149. A compound according to claim 137, wherein said at least one other element comprises at least one element selected from the group consisting of alkaline earth metals and alkali metals.

150. A compound according to claim 137, wherein said at least one other element

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comprises at least one element selected from the group consisting of organic compounds.

A1 cont.

151. A compound according to claim 137, wherein said at least one other element comprises at least one element selected from the group consisting of semiconductors.

152. A compound according to claim 137, wherein the compound has a formula selected from the group of formulae consisting of MH, $MH_2$, and $M_2H_2$ wherein M is an alkali cation and H is selected from the group consisting of increased binding energy hydride ions, hydrino atoms and dihydrino molecules.

153. A compound according to claim 137, wherein the compound has the formula $MH_n$ wherein n is 1 or 2, M is an alkaline earth cation and H is selected from the group consisting of increased binding energy hydride ions and increased binding energy hydrogen species.

154. A compound according to claim 137, wherein the compound has the formula MHX wherein M is an alkali cation, X is one of a neutral atom, a molecule, or a singly negatively charged anion, and H is elected from the group consisting of increased binding energy hydride ions and hydrino atoms.

155. A compound according to claim 137, wherein the compound has the formula MHX wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

156. A compound according to claim 137, wherein the compound has the formula MHX wherein M is an alkaline earth cation, X is a doubly negatively charged anion, and

H is a hydrino atom.

A1 cont.

157. A compound according to claim 137, wherein the compound has the formula $M_2HX$ wherein M is an alkali cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

158. A compound according to claim 137, wherein the compound has the formula $MH_n$ wherein n is an integer from 1 to 5, M is an alkali cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

159. A compound according to claim 137, wherein the compound has the formula $M_2H_n$ wherein n is an integer from 1 to 4, M is an alkaline earth cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

160. A compound according to claim 137, wherein the compound has the formula $M_2XH_n$ wherein n is an integer from 1 to 3, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

161. A compound according to claim 137, wherein the compound has the formula $M_2X_2H_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

162. A compound according to claim 137, wherein the compound has the formula $M_2X_3H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

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A1 cont.

163. A compound according to claim 137, wherein the compound has the formula $M_2XH_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

164. A compound according to claim 137, wherein the compound has the formula $M_2XX'H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, X' is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

165. A compound according to claim 137, wherein the compound has the formula $MM'H_n$ wherein n is and integer from 1 to 3, M is an alkaline earth cation, M' is an alkali metal cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

166. A compound according to claim 137, wherein the compound is $MM'XH_n$ wherein n is 1 to 2, M is an alkaline earth cation, M' is an alkali metal cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

167. A compound according to claim 137, wherein the compound is MM'XH where M is an alkaline earth cation, M' is an alkali metal cation, X is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

168. A compound according to claim 137, wherein the compound has the formula MM'XX'H where M is an alkaline earth cation, M' is an alkali metal cation, X and X' are each a singly negatively charged anion, and H is selected from the group

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consisting of increased binding energy hydride ions and hydrino atoms.

A1 cont.

169. A compound according to claim 137, wherein the compound has the formula $H_nS$ wherein n is 1 or 2, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

170. A compound according to claim 137, wherein the compound has the formula $MSiH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

171. A compound according to claim 137, wherein the compound has the formula $MXM'H_n$ wherein

n is an integer from 1 to 5;

M is an alkali or alkaline earth cation;

X is a singly negatively charged anion or a doubly negatively charged anion;

M' is selected from the group consisting of Si, Al, Ni, the transition elements, the inner transition elements, and the rare earth elements; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

172. A compound according to claim 137, wherein the compound has the formula $MAlH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

173. A compound according to claim 137, wherein the compound has the formula $MH_n$ wherein:

n is an integer from 1 to 6;

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M is selected from the group consisting of the transition elements, the inner transition elements, and the rare earth element cations and nickel; and

A1 cont.

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

174. A compound according to claim 137, wherein the compound has the formula $MNiH_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

175. A compound according to claim 137, wherein the compound has the formula $MM'H_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum;

M' is selected from the group consisting of the transition elements, the inner transition elements, and rare earth element cations; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

176. A compound according to claim 137, wherein the compound has the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

177. A compound according to claim 137, wherein the compound has the formula $Si_2H_n$

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wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

A' cont.

178. A compound according to claim 137, wherein the compound has the formula $SiH_n$ wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

179. A compound according to claim 137, wherein the compound has the formula $TiH_n$ wherein n is an integer from 1 to 4, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

180. A compound according to claim 137, wherein the compound has the formula $Al_2H_n$ wherein n is an integer from 1 to 4 and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

181. A compound according to claim 137, wherein the compound has the formula $MXAlX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

182. A compound according to claim 137, wherein the compound has the formula $MXSiX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

183. A compound according to claim 137, wherein the compound has the formula $SiO_2H_n$ wherein n is an integer from 1 to 6 and the hydrogen content $H_n$ comprises at least

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one increased binding energy hydrogen species.

A1 cont.

184. A compound according to claim 137, wherein the compound has the formula $MSiO_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

185. A compound according to claim 137, wherein the compound has the formula $MSi_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

186. A compound according to claim 137, wherein the compound has the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

B

187. A compound ~~composition~~ according to one of claims 154, 155, 157, 160, 161, 162, 164, 166, 168, 171, 181 and 182, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

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188. A compound ~~composition~~ according to one of claims 156, 163, 164, 167, 171, 181 and 182, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

189. A compound comprising at least one hydride ion having a binding energy of about 0.65 eV and at least one other element.

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190. A compound comprising at least one hydrino atom and at least one other element.

191. A compound comprising at least one dihydrino molecule and at least one other element.

192. A compound ~~comprising at least on~~ increased binding energy species and at least other element.

193. A compound according to any one of claims 189 to 192, wherein said at least one other element comprises at least one increased binding energy hydrogen species.

194. A compound according to any one of claims 189 to 192, wherein said at least one other element comprises at least one selected from the group consisting of a proton, ordinary hydrogen atom, ordinary hydrogen molecules and ordinary hydrogen molecular ions.

195. A compound according to any one of claims 189 to 192, wherein said at least one other element comprises at least one element selected from the group consisting of alkaline earth metals and alkali earth metals.

196. A compound according to any one of claims 189 to 192, wherein said at least one other element comprises at least one element selected from the group consisting of organic compounds.

197. A compound according to any one of claims 189 to 192, wherein said at least one other element comprises at least one element selected from the group consisting of semiconductors.

198. A hydride ion comprising an electron and a hydrino atom having a hydride binding energy represented by

A1 cont.

$$\text{Binding Energy} = \frac{\hbar^2\sqrt{s(s+1)}}{8\mu_e a_0^2\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^2} - \frac{\pi\mu_0 e^2\hbar^2}{m_e^2 a_0^3}\left(1+\frac{2^2}{\left[\frac{1+\sqrt{s(s+1)}}{p}\right]^3}\right)$$

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where p is an integer greater than 1, s = ½, ħ is Plank's constant bar, $\mu_0$ is the permeability of vacuum, $m_e$ is the mass of the electron, $\mu_e$ is the reduced electron mass, $a_0$ is the Bohr radius, and $e$ is the elementary charge.

199. A hydride ion according to claim 198, wherein the binding energy is about 3 eV.

200. A hydride ion according to claim 198, wherein the binding energy is about 7 eV.

201. A hydride ion according to claim 198, wherein the binding energy is about 11 eV.

202. A hydride ion according to claim 198, wherein the binding energy is about 17 eV.

203. A hydride ion according to claim 198, wherein the binding energy is about 23 eV.

204. A hydride ion according to claim 198, wherein the binding energy is about 29 eV.

205. A hydride ion according to claim 198, wherein the binding energy is about 36 eV.

206. A hydride ion according to claim 198, wherein the binding energy is about 43 eV.

207. A hydride ion according to claim 198, wherein the binding energy is about 49 eV.

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208. A hydride ion according to claim 198, wherein the binding energy is about 55 eV.

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209. A hydride ion according to claim 198, wherein the binding energy is about 61 eV.

210. A hydride ion according to claim 198, wherein the binding energy is about 66 eV.

211. A hydride ion according to claim 198, wherein the binding energy is about 69 eV.

212. A hydride ion according to claim 198, wherein the binding energy is about 71 eV.

213. A hydride ion according to claim 198, wherein the binding energy is about 72 eV.

214. A method for making a compound comprising:

reacting hydrino atoms with electrons to produce hydride ions having a binding energy greater than 0.8 eV; and

reacting said hydride ions with one or more cations, thereby producing said compound.

215. A method for making a compound comprising:

reacting hydrino atoms with electrons to produce hydride ions having a binding energy of about 0.65 eV; and

reacting said hydride ions with one or more cations, thereby producing said compound.

216. A method for making a compound comprising:

reacting hydrino atoms with electrons to produce hydride ions; and

reacting said hydride ions with one or more cations, thereby producing said compound.

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217. A method according to any one of claims 214 to 216, further comprising using a proton as the cation.

A1 cont.

218. A method according to any one of claims 214 to 216, further comprising using $H_3^+$ as the cation.

219. A method according to any one of claims 214 to 216, further comprising using a cation comprising an increased binding energy species.

220. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having a formula selected from the group of formulae consisting of MH, $MH_2$, and $M_2H_2$ wherein M is an alkali cation and H is selected from the group consisting of increased binding energy hydride ions, hydrino atoms and dihydrino molecules.

221. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MH_n$ wherein n is 1 or 2, M is an alkaline earth cation and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

222. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula MHX wherein M is an alkali cation, X is one of a neutral atom, a molecule, or a singly negatively charged anion, and H is elected from the group consisting of increased binding energy hydride ions and hydrino atoms.

223. A method according to any one of claims 214 to 216, wherein the method has the formula MHX wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy

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hydride ions and hydrino atoms.

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224. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula MHX wherein M is an alkaline earth cation, X is a doubly negatively charged anion, and H is a hydrino atom.

225. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2HX$ wherein M is an alkali cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

226. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MH_n$ wherein n is an integer from 1 to 5, M is an alkali cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

227. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2H_n$ wherein n is an integer from 1 to 4, M is an alkaline earth cation and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

228. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2XH_n$ wherein n is an integer from 1 to 3, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

229. A method according to any one of claims 214 to 216, wherein the method is

A1 cont.

conducted to produce a compound having the formula $M_2X_2H_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

230. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2X_3H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

231. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2XH_n$ wherein n is 1 or 2, M is an alkaline earth cation, X is a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

232. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2XX'H$ wherein M is an alkaline earth cation, X is a singly negatively charged anion, X' is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

233. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MM'H_n$ wherein n is and integer from 1 to 3, M is an alkaline earth cation, M' is an alkali metal cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

234. A method according to any one of claims 214 to 216, wherein the method is

$MM'XH_n$ wherein n is 1 to 2, M is an alkaline earth cation, M' is an alkali metal cation, X is a singly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

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235. A method according to any one of claims 214 to 216, wherein the method is MM'XH where M is an alkaline earth cation, M' is an alkali metal cation, X is a doubly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

236. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula MM'XX'H where M is an alkaline earth cation, M' is an alkali metal cation, X and X' are each a singly negatively charged anion, and H is selected from the group consisting of increased binding energy hydride ions and hydrino atoms.

237. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $H_nS$ wherein n is 1 or 2, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

238. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MSiH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content of $H_n$ comprises at least one increased binding energy hydrogen species.

239. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MXM'H_n$ wherein

n is an integer from 1 to 5;

M is an alkali or alkaline earth cation;

A1 cont

X is a singly negatively charged anion or a doubly negatively charged anion;

M' is selected from the group consisting of Si, Al, Ni, the transition elements, the inner transition elements, and the rare earth elements; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

240. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MAlH_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

241. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MH_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of the transition elements, the inner transition elements, and the rare earth element cations and nickel; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

242. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MNiH_n$ wherein:

n is an integer from 1 to 6;

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

243. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MM'H_n$ wherein:

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n is an integer from 1 to 6;

A1 cont

M is selected from the group consisting of alkali cations, alkaline earth cations, silicon, and aluminum;

M' is selected from the group consisting of the transition elements, the inner transition elements, and rare earth element cations; and

the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

244. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

245. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $Si_2H_n$ wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

246. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $SiH_n$ wherein n is an integer from 1 to 8, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

247. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $TiH_n$ wherein n is an integer from 1 to 4, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

248. A method according to any one of claims 214 to 216, wherein the method is

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conducted to produce a compound having the formula $Al_2H_n$ wherein n is an integer from 1 to 4 and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

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249. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MXAlX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

250. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MXSiX'H_n$ wherein n is 1 or 2, M is an alkali or alkaline earth cation, X and X' are each either a singly negatively charged anion or a doubly negatively charged anion, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

251. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $SiO_2H_n$ wherein n is an integer from 1 to 6 and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

252. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MSiO_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

253. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $MSi_2H_n$ wherein n is an integer from 1 to 6, M is an alkali or alkaline earth cation, and the hydrogen content

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$H_n$ comprises at least one increased binding energy hydrogen species.

A1 cont.

254. A method according to any one of claims 214 to 216, wherein the method is conducted to produce a compound having the formula $M_2SiH_n$ wherein n is an integer from 1 to 8, M is an alkali or alkaline earth cation, and the hydrogen content $H_n$ comprises at least one increased binding energy hydrogen species.

255. A method according to claim 222, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

256. A method according to claim 223, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

257. A method according to claim 225, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

258. A method according to claim 228, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

259. A method according to claim 229, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

260. A method according to claim 230, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen

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carbonate ions, and nitrate ions.

A1 cont.

261. A method according to claim 232, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

262. A method according to claim 234, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

263. A method according to claim 236, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

264. A method according to claim 239, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

265. A method according to claim 249, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

266. A method according to claim 250, wherein said singly negatively charged anion is selected from the group consisting of halogen ions, hydroxide ions, hydrogen carbonate ions, and nitrate ions.

267. A method according to claim 224, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

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A1 cont.

268. A method according to claim 231, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

269. A method according to claim 232, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

270. A method according to claim 235, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

271. A method according to claim 239, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

272. A method according to claim 249, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

273. A method according to claim 250, wherein said doubly negatively charged anion is selected from the group consisting of carbonate ions and sulfate ions.

274. A method according to any one of claims 214 to 216, wherein the method conducted to provide a product having greater that 50 atomic percent purity.

275. A method according to any one of claims 214 to 216, wherein the method is conducted to provide a product having greater that 90 atomic percent purity.

276. A method according to any one of claims 214 to 216, further comprising using a cation comprising at least one selected from the group consisting of a proton, ordinary hydrogen molecular ions, and ordinary $H_3^+$.

277. A method according to any one of claims 214 to 216, further comprising using a

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cation comprising at least at least one element selected from the group consisting of alkaline earth metals and alkali metals.

A1 cont

278. A method according to any one of claims 214 to 216, further comprising using a cation from the group consisting of organic compound ions.

279. A method according any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst having a net enthalpy of reaction of at least m27 eV, where m is an integer.

280. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst adapted to provide a resonant absorption with the energy released by said hydrogen atoms when said hydrogen atoms undergo a transition to a lower energy state.

281. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising a salt of rubidium.

282. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising a salt of potassium.

283. A method according to any one of claims 214 to 216, further comprising forming hydrino atoms from hydrogen atoms by use of a catalyst comprising a salt of titanium.

284. A method according to claim 280, wherein said salt of rubidium is selected from the group consisting of RbOH, $Rb_2SO_4$, $Rb_2CO_3$, and $Rb_3PO_4$.

285. A method according to claim 281, wherein said salt of potassium is selected from the group consisting of KOH, $K_2SO_4$, $K_2CO_3$ and $K_3PO_4$.

A1 cont.

286. A method according to claim 281, wherein said salt of potassium is $K_2CO_3$.

287. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising an ion selected from the group consisting of ($Rb^+$), ($Mo^{2+}$), and ($Ti^{2+}$).

288. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst selected from the group consisting of ($Al^{2+}$), ($Ar^+$), ($Ti^{2+}$), ($As^{2+}$), ($Rb^+$), ($Mo^{2+}$), ($Ru^{2+}$), ($In^{2+}$), and ($Te^{2+}$).

289. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst capable of providing a net enthalpy of reaction in the range of 26.8 to 28.5 eV.

290. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising at least one pair of ions selected from the group consisting of: ($Sn^{4+}$, $Si^{4+}$), ($Pr^{3+}$, $Ca^{2+}$), ($Sr^{2+}$, $Cr^{2+}$), ($Cr^{3+}$, $Tb^{3+}$), ($Sb^{3+}$,$Co^{2+}$), ($Bi^{3+}$, $Ni^{2+}$), ($Pd^{2+}$, $In^+$), ($La^{3+}$, $Dy^{3+}$), ($La^{3+}$, $Ho^{3+}$), ($K^+$, $K^+$) , ($V^{3+}$, $Pd^{2+}$), ($Lu^{3+}$, $Zn^{2+}$), ($As^{3+}$, $Ho^{3+}$), ($Mo^{5+}$, $Sn^{4+}$), ($Sb^{3+}$, $Cd^{2+}$), ($Ag^{2+}$,$Ag^+$), ($La^{3+}$, $Er^{3+}$), ($V^{4+}$, $B^{3+}$), ($Fe^{3+}$, $Ti^{3+}$), ($Co^{2+}$, $Ti^+$), ($Bi^{3+}$, $Zn^{2+}$), ($As^{3+}$, $Dy^{3+}$), ($Ho^{3+}$, $Mg^{2+}$), ($K^+$, $Rb^+$), ($Cr^{3+}$, $Pr^{3+}$), ($Sr^{2+}$, $Fe^{2+}$), ($Ni^{2+}$, $Cu^+$), ($Li^+$, $Pb^{2+}$), ($Sr^{2+}$, $Mo^{2+}$), ($Y^{3+}$, $Zr^{4+}$), ($Cd^{2+}$, $Ba^{2+}$), ($Ho^{3+}$, $Pb^{2+}$), ($Eu^{3+}$, $Mg^{2+}$), ($Er^{3+}$, $Mg^{2+}$), ($Bi^{4+}$, $Al^{3+}$), ($Ca^{2+}$, $Sm^{3+}$), ($V^{3+}$, $La^{3+}$), ($Gd^{3+}$, $Cr^{2+}$), ($Mn^{2+}$, $Ti^+$), ($Yb^{3+}$, $Fe^{2+}$), ($Ni^{2+}$, $Ag^+$), ($Zn^{2+}$, $Yb^{2+}$), ($Se^{4+}$, $Sn^{4+}$), ($Sb^{3+}$, $Bi^{2+}$), and ($Eu^{3+}$, $Pb^{2+}$).

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A1 cont.

291. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising oxygen in combination with at least one atom selected from the group consisting of Cu, As, Pd, Te, Cs and Pt.

292. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising at least one pair selected from the group consisting of: (B, $Li^+$), (S, $Li^+$), (Br, $Li^+$), ($Pm^+$, $Li^+$), ($Sm^+$, $Li^+$), ($Tb^+$, $Li^+$), ($Dy^+$, $Li^+$), ($Sb^+$, $H^+$) and ($Bi^+$, $H^+$).

293. A method according to any one of claims 214 to 216,further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising at least one pair selected from the group consisting of:

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| | | |
|---|---|---|
| ( He 0+ , Co 3+ ); | (O 1+ , Nd 4+ ); | (Al 2+ , Cl 5+ ); |
| ( He 0+ , Ga 3+ ); | (O 1+ , Tb 4+ ); | (Al 4+ , Mn 8+ ); |
| ( Li 0+ , Ni 3+ ); | (O 2+ , Ne 3+ ); | (Si 1+ , Mg 2+ ); |
| ( Li 0+ , Xe 3+ ); | (O 3+ , Sb 6+ ); | (Si 1+ , V 2+ ); |
| ( Li 0+ , Hg 3+ ); | (O 4+ , Fe 7+ ); | (Si 1+ , Tc 2+ ); |
| ( Li 1+ , Na 4+ ); | (F 0+ , Al 2+ ); | (Si 1+ , Sn 2+ ); |
| ( Li 1+ , Y 6+ ); | (F 0+ , Si 2+ ); | (Si 1+ , Hf 2+ ); |
| ( Be 1+ , Bi 6+ ); | (F 0+ , Fe 2+ ); | (Si 1+ , Pb 2+ ); |
| ( Be 2+ , Al 6+ ); | (F 0+ , Co 2+ ); | (Si 2+ , Co 3+ ); |
| ( B 1+ , C 2+ ); | (F 0+ , Ru 2+ ); | (Si 2+ , Ga 3+ ); |
| ( B 1+ , K 2+ ); | (F 0+ , In 2+ ); | (Si 2+ , Ge 3+ ); |
| ( B 1+ , Ho 3+ ); | (F 0+ , Sb 2+ ); | (Si 2+ , Tl 3+ ); |
| ( B 1+ , Er 3+ ); | (F 0+ , Bi 2+ ); | (Si 3+ , Ni 6+ ); |
| ( B 1+ , Tm 3+ ); | (F 1+ , Sb 4+ ); | (Si 3+ , Rb 7+ ); |
| ( B 1+ , Lu 3+ ); | (F 3+ , Fe 6+ ); | (Si 4+ , Al 6+ ); |
| ( C 1+ , N 2+ ); | (Ne 0+ , Sm 3+ ); | (P 1+ , Mg 2+ ); |
| ( C 1+ , V 3+ ); | (Ne 0+ , Dy 3+ ); | (P 1+ , Tc 2+ ); |
| ( C 1+ , Tc 3+ ); | (Ne 0+ , Ho 3+ ); | (P 1+ , Sn 2+ ); |
| ( C 1+ , Ru 3+ ); | (Ne 0+ , Er 3+ ); | (P 1+ , Hf 2+ ); |
| ( C 1+ , Sn 3+ ); | (Ne 0+ , Lu 3+ ); | (P 1+ , Pb 2+ ); |
| ( C 2+ , Mn 4+ ); | (Ne 1+ , N 3+ ); | (P 2+ , Ni 3+ ); |
| ( C 2+ , Co 4+ ); | (Ne 1+ , K 3+ ); | (P 2+ , Cd 3+ ); |
| ( N 0+ , Sr 2+ ); | (Ne 1+ , V 4+ ); | (P 2+ , Xe 3+ ); |
| ( N 0+ , La 2+ ); | (Ne 2+ , O 4+ ); | (P 3+ , Nb 5+ ); |
| ( N 0+ , Ce 2+ ); | (Na 0+ , Al 2+ ); | (P 5+ , C 5+ ); |
| ( N 0+ , Pr 2+ ); | (Na 0+ , Si 2+ ); | (S 1+ , P 2+ ); |
| ( N 0+ , Nd 2+ ); | (Na 0+ , Fe 2+ ); | (S 1+ , Se 2+ ); |
| ( N 0+ , Pm 2+ ); | (Na 0+ , Co 2+ ); | (S 1+ , La 3+ ); |

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( N 0+ , Sm 2+ );
( N 0+ , Eu 2+ );
( N 1+ , O 2+ );
( N 1+ , Si 3+ );
( N 1+ , P 3+ );
( N 1+ , Mn 3+ );
( N 1+ , Rh 3+ );
( N 2+ , F 3+ );
( N 3+ , Br 6+ );
( O 0+ , Ti 2+ );
( O 0+ , V 2+ );
( O 0+ , Nb 2+ );
( O 0+ , Hf 2+ );
( O 1+ , Ne 2+ );
( O 1+ , Ca 3+ );
( Cl 2+ , Ho 4+ );
( Cl 2+ , Er 4+ );
( Cl 3+ , Cl 4+ );
( Cl 5+ , Ni 6+ );
( Cl 5+ , Cu 6+ );
( Cl 5+ , Rb 7+ );
( Ar 0+ , Ba 2+ );
( Ar 0+ , Ce 2+ );
( Ar 0+ , Pr 2+ );
( Ar 0+ , Nd 2+ );
( Ar 0+ , Ra 2+ );
( Ar 1+ , Ti 3+ );
( Ar 2+ , C 3+ );
( Ar 3+ , K 4+ );
( Ar 3+ , Br 5+ );
( Ar 3+ , Mo 5+ );
( Ar 4+ , Y 5+ );
( K 1+ , Si 3+ );
( K 1+ , P 3+ );
( K 1+ , Mn 3+ );
( K 1+ , Ge 3+ );
( K 1+ , Rh 3+ );
( K 1+ , Tl 3+ );
( K 2+ , He 2+ );
( K 2+ , Si 4+ );
( K 2+ , As 4+ );
( K 3+ , P 5+ );
( K 3+ , Zr 5+ );
( K 4+ , Rb 6+ );
( K 5+ , Mg 4+ );
( K 5+ , Kr 7+ );
( K 6+ , Y 8+ );
( Ca 1+ , C 2+ );
( Ca 1+ , Sm 3+ );
( Ca 1+ , Dy 3+ );

(Na 0+ , Ru 2+ );
(Na 0+ , In 2+ );
(Na 0+ , Sb 2+ );
(Na 0+ , Bi 2+ );
(Na 2+ , Ti 5+ );
(Na 2+ , Kr 6+ );
(Na 3+ , Y 7+ );
(Mg 1+ , Rb 3+ );
(Mg 1+ , Eu 4+ );
(Mg 3+ , Ne 5+ );
(Mg 6+ , Cl 8+ );
(Al 1+ , Sc 2+ );
(Al 1+ , Zr 2+ );
(Al 1+ , Lu 2+ );
(Al 2+ , S 5+ );
(Sc 4+ , N 5+ );
(Ti 2+ , Ar 2+ );
(Ti 2+ , Mo 3+ );
(Ti 4+ , O 5+ );
(Ti 4+ , Zn 6+ );
(Ti 4+ , As 6+ );
(V 1+ , Sr 2+ );
(V 1+ , La 2+ );
(V 1+ , Ce 2+ );
(V 1+ , Pr 2+ );
(V 1+ , Nd 2+ );
(V 1+ , Pm 2+ );
(V 1+ , Sm 2+ );
(V 1+ , Eu 2+ );
(V 2+ , O 2+ );
(V 3+ , Mn 4+ );
(V 3+ , Co 4+ );
(V 4+ , Ar 6+ );
(V 4+ , Sc 5+ );
(V 5+ , Mg 5+ );
(V 6+ , Sc 8+ );
(V 6+ , Br 8+ );
(Cr 1+ , Sc 2+ );
(Cr 1+ , Ti 2+ );
(Cr 1+ , Zr 2+ );
(Cr 1+ , Lu 2+ );
(Cr 2+ , F 2+ );
(Cr 2+ , Na 2+ );
(Cr 2+ , Se 3+ );
(Cr 2+ , Pd 3+ );
(Cr 2+ , I 3+ );
(Cr 2+ , Hg 3+ );
(Cr 3+ , O 3+ );
(Cr 3+ , Ni 4+ );
(Cr 4+ , O 4+ );

(S 1+ , Ce 3+ );
(S 1+ , Au 2+ );
(S 2+ , Sr 3+ );
(S 2+ , Cd 3+ );
(S 3+ , Cu 4+ );
(S 3+ , Rb 4+ );
(S 4+ , O 4+ );
(Cl 1+ , C 2+ );
(Cl 1+ , K 2+ );
(Cl 1+ , Zr 3+ );
(Cl 1+ , Eu 3+ );
(Cl 1+ , Tm 3+ );
(Cl 2+ , Te 4+ );
(Cl 2+ , Sm 4+ );
(Cl 2+ , Gd 4+ );
(Mn 4+ , Ge 5+ );
(Fe 1+ , Sc 2+ );
(Fe 1+ , Y 2+ );
(Fe 1+ , Yb 2+ );
(Fe 1+ , Lu 2+ );
(Fe 2+ , S 3+ );
(Fe 2+ , Cu 3+ );
(Fe 2+ , Zn 3+ );
(Fe 2+ , Br 3+ );
(Fe 2+ , Zr 4+ );
(Fe 2+ , Ce 4+ );
(Fe 5+ , Sr 7+ );
(Co 1+ , Mg 2+ );
(Co 1+ , Cr 2+ );
(Co 1+ , Mn 2+ );
(Co 1+ , Mo 2+ );
(Co 1+ , Tc 2+ );
(Co 1+ , Pb 2+ );
(Co 2+ , Cu 3+ );
(Co 2+ , Zn 3+ );
(Co 2+ , Br 3+ );
(Co 2+ , Zr 4+ );
(Co 2+ , Ag 3+ );
(Co 2+ , Ce 4+ );
(Co 2+ , Hf 4+ );
(Co 4+ , Nb 6+ );
(Co 5+ , Sc 6+ );
(Ni 1+ , Co 2+ );
(Ni 1+ , Ni 2+ );
(Ni 1+ , Rh 2+ );
(Ni 1+ , Cd 2+ );
(Ni 1+ , Sb 2+ );
(Ni 2+ , Ne 2+ );
(Ni 2+ , Ca 3+ );
(Ni 2+ , Nd 4+ );

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A1 cont.

| | | |
|---|---|---|
| ( Ca 1+ , Ho 3+ ); | (Cr 5+ , Ne 5+ ); | (Ni 2+ , Tb 4+ ); |
| ( Ca 1+ , Er 3+ ); | (Cr 5+ , Fe 7+ ); | (Ni 4+ , Rb 6+ ); |
| ( Ca 1+ , Tm 3+ ); | (Mn 1+ , V 2+ ); | (Ni 6+ , Ar 8+ ); |
| ( Ca 1+ , Lu 3+ ); | (Mn 1+ , Nb 2+ ); | (Cu 1+ , Ag 2+ ); |
| ( Ca 2+ , O 3+ ); | (Mn 1+ , Sn 2+ ); | (Cu 1+ , I 2+ ); |
| ( Ca 2+ , Ni 4+ ); | (Mn 1+ , Hf 2+ ); | (Cu 1+ , Cs 2+ ); |
| ( Ca 3+ , Mn 5+ ); | (Mn 2+ , Cu 3+ ); | (Cu 1+ , Au 2+ ); |
| ( Ca 3+ , Rb 5+ ); | (Mn 2+ , Zn 3+ ); | (Cu 1+ , Hg 2+ ); |
| ( Ca 4+ , Cl 6+ ); | (Mn 2+ , Br 3+ ); | (Cu 2+ , Sm 4+ ); |
| ( Ca 4+ , Ar 6+ ); | (Mn 2+ , Zr 4+ ); | (Cu 2+ , Gd 4+ ); |
| ( Ca 4+ , Sc 5+ ); | (Mn 2+ , Ce 4+ ); | (Cu 2+ , Dy 4+ ); |
| ( Ca 5+ , Y 7+ ); | (Mn 2+ , Hf 4+ ); | (Cu 3+ , K 4+ ); |
| ( Sc 2+ , Ti 4+ ); | (Mn 3+ , Mg 3+ ); | (Cu 3+ , Br 5+ ); |
| ( Sc 2+ , Bi 4+ ); | (Mn 3+ , Te 5+ ); | (Cu 3+ , Mo 5+ ); |
| ( Cu 4+ , Rb 6+ ); | (Se 1+ , Fe 2+ ); | (Sr 1+ , Ga 2+ ); |
| ( Cu 5+ , Mn 7+ ); | (Se 1+ , Co 2+ ); | (Sr 1+ , Te 2+ ); |
| ( Zn 1+ , P 2+ ); | (Se 1+ , Ge 2+ ); | (Sr 1+ , Pt 2+ ); |
| ( Zn 1+ , I 2+ ); | (Se 1+ , Ru 2+ ); | (Sr 1+ , Tl 2+ ); |
| ( Zn 1+ , La 3+ ); | (Se 1+ , In 2+ ); | (Sr 2+ , C 3+ ); |
| ( Zn 1+ , Au 2+ ); | (Se 1+ , Bi 2+ ); | (Sr 2+ , Mo 4+ ); |
| ( Zn 1+ , Hg 2+ ); | (Se 2+ , Te 3+ ); | (Sr 3+ , Ar 4+ ); |
| ( Zn 2+ , Ti 4+ ); | (Se 3+ , Br 4+ ); | (Sr 3+ , Sr 4+ ); |
| ( Zn 2+ , Sn 4+ ); | (Se 5+ , Y 7+ ); | (Sr 3+ , Sb 5+ ); |
| ( Zn 2+ , Bi 4+ ); | (Br 1+ , P 2+ ); | (Sr 3+ , Bi 5+ ); |
| ( Zn 3+ , As 5+ ); | (Br 1+ , I 2+ ); | (Sr 4+ , Ar 5+ ); |
| ( Zn 4+ , Sr 6+ ); | (Br 1+ , La 3+ ); | (Sr 4+ , Cu 5+ ); |
| ( Zn 5+ , Mn 7+ ); | (Br 1+ , Au 2+ ); | (Y 2+ , Sr 3+ ); |
| ( Zn 6+ , Mo 8+ ); | (Br 3+ , He 2+ ); | (Y 2+ , Cd 3+ ); |
| ( Ga 1+ , Cr 2+ ); | (Br 3+ , Si 4+ ); | (Y 3+ , Se 5+ ); |
| ( Ga 1+ , Mn 2+ ); | (Br 3+ , Ge 4+ ); | (Y 3+ , Pb 5+ ); |
| ( Ga 1+ , Fe 2+ ); | (Br 4+ , S 5+ ); | (Y 4+ , Ti 5+ ); |
| ( Ga 1+ , Ge 2+ ); | (Br 4+ , Cl 5+ ); | (Y 4+ , Zn 5+ ); |
| ( Ga 1+ , Mo 2+ ); | (Br 5+ , Sb 6+ ); | (Y 5+ , Co 6+ ); |
| ( Ga 1+ , Ru 2+ ); | (Br 6+ , Ar 8+ ); | (Y 6+ , K 7+ ); |
| ( Ga 1+ , Bi 2+ ); | (Kr 1+ , B 2+ ); | (Zr 2+ , P 2+ ); |
| ( Ga 2+ , Rb 3+ ); | (Kr 1+ , S 2+ ); | (Zr 2+ , Ag 2+ ); |
| ( Ga 2+ , Eu 4+ ); | (Kr 1+ , Br 2+ ); | (Zr 2+ , I 2+ ); |
| ( Ga 2+ , Tm 4+ ); | (Kr 1+ , Xe 2+ ); | (Zr 2+ , Cs 2+ ); |
| ( Ge 1+ , Mg 2+ ); | (Kr 1+ , Nd 3+ ); | (Zr 2+ , La 3+ ); |
| ( Ge 1+ , Mn 2+ ); | (Kr 1+ , Pm 3+ ); | (Zr 2+ , Au 2+ ); |
| ( Ge 1+ , Tc 2+ ); | (Kr 1+ , Tb 3+ ); | (Zr 2+ , Hg 2+ ); |
| ( Ge 1+ , Sn 2+ ); | (Kr 2+ , Kr 3+ ); | (Nb 2+ , C 2+ ); |
| ( Ge 1+ , Pb 2+ ); | (Kr 2+ , Tb 4+ ); | (Nb 2+ , K 2+ ); |
| ( Ge 2+ , F 2+ ); | (Kr 3+ , O 3+ ); | (Nb 2+ , Zr 3+ ); |
| ( Ge 2+ , Na 2+ ); | (Kr 3+ , Ni 4+ ); | (Nb 2+ , Eu 3+ ); |
| ( Ge 2+ , Se 3+ ); | (Kr 3+ , Kr 4+ ); | (Nb 2+ , Tm 3+ ); |
| ( Ge 2+ , Pd 3+ ); | (Kr 3+ , Nb 5+ ); | (Nb 2+ , Lu 3+ ); |
| ( Ge 2+ , I 3+ ); | (Kr 4+ , Zr 5+ ); | (Nb 3+ , Kr 3+ ); |
| ( Ge 3+ , V 5+ ); | (Kr 5+ , Sr 6+ ); | (Nb 3+ , Pr 4+ ); |
| ( Ge 3+ , Se 5+ ); | (Kr 6+ , Y 7+ ); | (Nb 3+ , Tb 4+ ); |

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A1 cont.



( Ge 3+ , Pb 5+ );
( As 1+ , Sc 2+ );
( As 1+ , Y 2+ );
( As 1+ , Zr 2+ );
( As 1+ , Lu 2+ );
( As 2+ , Co 3+ );
( As 2+ , Ga 3+ );
( As 2+ , Ge 3+ );
( As 2+ , Tl 3+ );
( As 3+ , Fe 4+ );
( As 4+ , Sb 6+ );
( Se 1+ , Al 2+ );
( Se 1+ , Si 2+ );
( Tc 1+ , Sr 2+ );
( Tc 1+ , La 2+ );
( Tc 1+ , Ce 2+ );
( Tc 1+ , Pm 2+ );
( Tc 1+ , Sm 2+ );
( Tc 1+ , Eu 2+ );
( Tc 1+ , Tb 2+ );
( Tc 1+ , Dy 2+ );
( Ru 1+ , Ca 2+ );
( Ru 1+ , Eu 2+ );
( Ru 1+ , Tb 2+ );
( Ru 1+ , Dy 2+ );
( Ru 1+ , Ho 2+ );
( Ru 1+ , Er 2+ );
( Rh 1+ , V 2+ );
( Rh 1+ , Nb 2+ );
( Rh 1+ , Sn 2+ );
( Rh 1+ , Hf 2+ );
( Pd 1+ , Al 2+ );
( Pd 1+ , Si 2+ );
( Pd 1+ , Fe 2+ );
( Pd 1+ , Co 2+ );
( Pd 1+ , Ru 2+ );
( Pd 1+ , In 2+ );
( Pd 1+ , Sb 2+ );
( Pd 1+ , Bi 2+ );
( Ag 1+ , Cu 2+ );
( Ag 1+ , As 2+ );
( Ag 1+ , Ag 2+ );
( Ag 1+ , Cs 2+ );
( Ag 1+ , Hg 2+ );
( Cd 1+ , Zn 2+ );
( Cd 1+ , Ga 2+ );
( Cd 1+ , Cd 2+ );
( Cd 1+ , Tl 2+ );
( In 1+ , Sc 2+ );
( In 1+ , Y 2+ );
(Rb 1+ , Nb 3+ );
(Rb 2+ , Te 4+ );
(Rb 2+ , Sm 4+ );
(Rb 2+ , Gd 4+ );
(Rb 2+ , Dy 4+ );
(Rb 2+ , Ho 4+ );
(Rb 2+ , Er 4+ );
(Rb 3+ , Mg 3+ );
(Rb 3+ , Te 5+ );
(Rb 5+ , Rb 6+ );
(Rb 6+ , Te 7+ );
(Sr 1+ , Be 2+ );
(Sr 1+ , Zn 2+ );
(Sn 1+ , Er 2+ );
(Sn 2+ , N 2+ );
(Sn 2+ , Ar 2+ );
(Sn 2+ , V 3+ );
(Sn 2+ , Mo 3+ );
(Sn 3+ , Mn 4+ );
(Sn 3+ , Fe 4+ );
(Sn 3+ , Co 4+ );
(Sb 2+ , Ti 3+ );
(Sb 2+ , Sb 3+ );
(Sb 2+ , Bi 3+ );
(Sb 3+ , C 3+ );
(Te 1+ , Sc 2+ );
(Te 1+ , Y 2+ );
(Te 1+ , Gd 2+ );
(Te 1+ , Tm 2+ );
(Te 1+ , Yb 2+ );
(Te 1+ , Lu 2+ );
(Te 2+ , Sc 3+ );
(Te 2+ , Kr 2+ );
(Te 2+ , Yb 3+ );
(Te 2+ , Hf 3+ );
(Te 3+ , Ar 3+ );
(Te 3+ , La 4+ );
(Te 3+ , Yb 4+ );
(Te 4+ , Bi 5+ );
(I 1+ , Al 2+ );
(I 1+ , Si 2+ );
(I 1+ , Fe 2+ );
(I 1+ , Co 2+ );
(I 1+ , Ge 2+ );
(I 1+ , Ru 2+ );
(I 1+ , In 2+ );
(I 1+ , Bi 2+ );
(Xe 1+ , Al 2+ );
(Xe 1+ , Co 2+ );
(Xe 1+ , Ni 2+ );
(Nb 4+ , N 4+ );
(Mo 1+ , Ba 2+ );
(Mo 1+ , Pr 2+ );
(Mo 1+ , Nd 2+ );
(Mo 1+ , Ra 2+ );
(Mo 2+ , Ru 3+ );
(Mo 2+ , Sn 3+ );
(Mo 3+ , Cr 4+ );
(Mo 3+ , Ge 4+ );
(Mo 4+ , Bi 5+ );
(Mo 5+ , Mn 6+ );
(Mo 6+ , O 6+ );
(Mo 6+ , Cr 7+ );
(Pr 2+ , Xe 2+ );
(Pr 2+ , Pr 3+ );
(Pr 2+ , Nd 3+ );
(Pr 2+ , Pm 3+ );
(Pr 2+ , Gd 3+ );
(Pr 2+ , Tb 3+ );
(Nd 2+ , Sm 3+ );
(Nd 2+ , Dy 3+ );
(Nd 2+ , Ho 3+ );
(Nd 2+ , Er 3+ );
(Nd 2+ , Lu 3+ );
(Pm 2+ , C 2+ );
(Pm 2+ , K 2+ );
(Pm 2+ , Zr 3+ );
(Pm 2+ , Eu 3+ );
(Pm 2+ , Tm 3+ );
(Sm 2+ , Cl 2+ );
(Sm 2+ , Sc 3+ );
(Sm 2+ , Yb 3+ );
(Eu 2+ , Nb 3+ );
(Gd 2+ , Cl 2+ );
(Gd 2+ , Sc 3+ );
(Gd 2+ , Eu 3+ );
(Gd 2+ , Yb 3+ );
(Tb 2+ , B 2+ );
(Tb 2+ , S 2+ );
(Tb 2+ , Br 2+ );
(Tb 2+ , Xe 2+ );
(Tb 2+ , Sm 3+ );
(Tb 2+ , Tb 3+ );
(Tb 2+ , Dy 3+ );
(Tb 2+ , Ho 3+ );
(Tb 2+ , Er 3+ );
(Dy 2+ , Cl 2+ );
(Dy 2+ , K 2+ );
(Dy 2+ , Zr 3+ );
(Dy 2+ , Eu 3+ );

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A1 cont.

| | | |
|---|---|---|
| ( In 1+ , Yb 2+ ); | (Xe 1+ , Rh 2+ ); | (Dy 2+ , Yb 3+ ); |
| ( In 1+ , Lu 2+ ); | (Xe 1+ , Cd 2+ ); | (Ho 2+ , Sc 3+ ); |
| ( In 2+ , Sr 3+ ); | (Xe 1+ , Sb 2+ ); | (Ho 2+ , Yb 3+ ); |
| ( In 2+ , Cd 3+ ); | (La 2+ , Ti 3+ ); | (Ho 2+ , Hf 3+ ); |
| ( Sn 1+ , Ca 2+ ); | (La 2+ , Sb 3+ ); | (Er 2+ , Sc 3+ ); |
| ( Sn 1+ , Sr 2+ ); | (Ce 2+ , Ag 2+ ); | (Er 2+ , Yb 3+ ); |
| ( Sn 1+ , La 2+ ); | (Ce 2+ , I 2+ ); | (Er 2+ , Hf 3+ ); |
| ( Sn 1+ , Sm 2+ ); | (Ce 2+ , Cs 2+ ); | (Tm 2+ , Kr 2+ ); |
| ( Sn 1+ , Eu 2+ ); | (Ce 2+ , Au 2+ ); | (Tm 2+ , Nb 3+ ); |
| ( Sn 1+ , Tb 2+ ); | (Ce 2+ , Hg 2+ ); | (Tm 2+ , Hf 3+ ); |
| ( Sn 1+ , Dy 2+ ); | (Pr 2+ , B 2+ ); | (Yb 2+ , Ti 3+ ); |
| ( Sn 1+ , Ho 2+ ); | (Pr 2+ , Y 3+ ); | (Lu 2+ , Kr 2+ ); |
| ( Lu 2+ , Hf 3+ ); | (Pb 2+ , As 3+ ); | (Tl 1+ , Mg 2+ ); |
| ( Hf 2+ , As 2+ ); | (Pb 2+ , In 3+ ); | (Tl 1+ , Mn 2+ ); |
| ( Hf 2+ , Ag 2+ ); | (Pb 2+ , Te 3+ ); | (Tl 1+ , Mo 2+ ); |
| ( Hf 2+ , I 2+ ); | (Pb 2+ , Pb 3+ ); | (Tl 1+ , Tc 2+ ); |
| ( Hf 2+ , Cs 2+ ); | (Pb 3+ , Br 4+ ); | (Tl 1+ , Sn 2+ ); |
| ( Hf 2+ , Hg 2+ ); | (Bi 1+ , Ba 2+ ); | (Tl 1+ , Pb 2+ ); |
| ( Hg 1+ , Al 2+ ); | (Bi 2+ , Ar 2+ ); | (Pb 1+ , Sc 2+ ); |
| ( Hg 1+ , Si 2+ ); | (Bi 2+ , Mo 3+ ); | (Pb 1+ , Y 2+ ); |
| ( Hg 1+ , Co 2+ ); | (Bi 3+ , Se 4+ ); | (Pb 1+ , Lu 2+ ); and |
| ( Hg 1+ , Ni 2+ ); | (Bi 3+ , Mo 4+ ); | (Pb 2+ , Fe 3+ ). |
| ( Hg 1+ , Rh 2+ ); | (Bi 3+ , Pb 4+ ); | |
| ( Hg 1+ , Cd 2+ ); | (Bi 4+ , P 5+ ); | |
| ( Hg 1+ , In 2+ ); | (Bi 4+ , Kr 5+ ); | |
| ( Hg 1+ , Sb 2+ ); | (Bi 4+ , Zr 5+ ); | |

294. A method according to any one of claims 214 to 216, further comprising forming said hydrino atoms from hydrogen atoms by use of a catalyst comprising at least one free atom selected from the group consisting of Be, Cu, Zn, Pd, Te and Pt.

295. A method according to any one of claims 214 to 216, further comprising forming hydrino atoms from hydrogen atoms by use of a catalyst comprising at least one set of two species selected from the group consisting of:

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| | | |
|---|---|---|
| ( Li 0+ , Ar 5+ ); | ( P 1+ , Nd 4+ ); | ( Ti 2+ , As 5+ ); |
| ( Li 0+ , Mo 6+ ); | ( P 1+ , Tb 4+ ); | ( Ti 2+ , Se 5+ ); |
| ( Be 0+ , Kr 5+ ); | ( P 3+ , Na 5+ ); | ( V 1+ , Cd 3+ ); |
| ( B 0+ , Sc 3+ ); | ( S 0+ , Sm 3+ ); | ( V 1+ , I 3+ ); |
| ( B 0+ , Zr 3+ ); | ( S 0+ , Dy 3+ ); | ( V 1+ , Hg 3+ ); |
| ( B 0+ , Yb 3+ ); | ( S 0+ , Ho 3+ ); | ( V 2+ , Kr 4+ ); |
| ( C 0+ , Te 3+ ); | ( S 0+ , Er 3+ ); | ( V 2+ , Nb 5+ ); |
| ( C 0+ , Tl 3+ ); | ( S 0+ , Lu 3+ ); | ( V 4+ , Ni 7+ ); |
| ( N 0+ , Ag 3+ ); | ( S 1+ , Nb 4+ ); | ( V 4+ , Kr 8+ ); |
| ( N 0+ , Cd 3+ ); | ( S 1+ , Ho 4+ ); | ( Cr 1+ , S 3+ ); |

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A1 cont.

( N 0+ , Hg 3+ ); ( S 1+ , Er 4+ ); ( Cr 1+ , Ca 3+ );

( N 1+ , Bi 5+ ); ( S 1+ , Tm 4+ ); ( Cr 3+ , Be 3+ );

( N 2+ , Br 6+ ); ( S 2+ , Bi 5+ ); ( Cr 3+ , Zn 5+ );

( N 2+ , Kr 6+ ); ( Cl 0+ , Ti 3+ ); ( Cr 5+ , Cu 8+ );

( O 0+ , Cl 3+ ); ( Cl 1+ , Mo 4+ ); ( Mn 1+ , Nd 4+ );

( O 0+ , Kr 3+ ); ( Cl 1+ , Pb 4+ ); ( Mn 1+ , Tb 4+ );

( O 0+ , Sm 4+ ); ( Cl 3+ , Sc 5+ ); ( Mn 2+ , Ca 4+ );

( O 0+ , Dy 4+ ); ( Cl 4+ , Br 7+ ); ( Mn 3+ , Nb 6+ );

( O 2+ , Na 4+ ); ( Ar 0+ , Mn 3+ ); ( Mn 5+ , Ca 8+ );

( O 2+ , Cl 6+ ); ( Ar 0+ , As 3+ ); ( Fe 1+ , Nd 4+ );

( O 2+ , Mn 6+ ); ( Ar 0+ , Rh 3+ ); ( Fe 1+ , Pm 4+ );

( O 3+ , Al 5+ ); ( Ar 0+ , Tl 3+ ); ( Fe 1+ , Tb 4+ );

( F 0+ , Bi 4+ ); ( Ar 1+ , Mn 4+ ); ( Fe 3+ , Ne 4+ );

( F 1+ , Mn 5+ ); ( Ar 1+ , In 4+ ); ( Fe 5+ , Mo 8+ );

( F 3+ , Mg 5+ ); ( Ar 5+ , Mg 5+ ); ( Co 1+ , Pm 4+ );

( F 4+ , Ti 8+ ); ( K 0+ , Al 3+ ); ( Co 2+ , C 4+ );

( Ne 1+ , Ge 5+ ); ( K 0+ , Cr 3+ ); ( Co 3+ , Mg 4+ );

( Ne 4+ , Al 6+ ); ( K 0+ , Pb 3+ ); ( Ni 1+ , La 4+ );

( Na 0+ , Cr 4+ ); ( K 1+ , Sc 4+ ); ( Ni 1+ , Yb 4+ );

( Na 0+ , Ge 4+ ); ( K 2+ , Cl 5+ ); ( Ni 1+ , Lu 4+ );

( Na 1+ , Sc 5+ ); ( Ca 0+ , Eu 3+ ); ( Ni 2+ , K 4+ );

( Na 1+ , Bi 6+ ); ( Ca 0+ , Dy 3+ ); ( Ni 5+ , Fe 8+ );

( Na 3+ , Ne 6+ ); ( Ca 0+ , Ho 3+ ); ( Cu 0+ , Ce 3+ );

( Na 4+ , Ne 7+ ); ( Ca 0+ , Er 3+ ); ( Cu 0+ , Pr 3+ );

( Mg 0+ , Kr 3+ ); ( Ca 1+ , Mg 3+ ); ( Cu 1+ , Ar 3+ );

( Mg 2+ , Al 5+ ); ( Ca 1+ , Fe 4+ ); ( Cu 1+ , Ti 4+ );

( Mg 3+ , Na 6+ ); ( Ca 1+ , Co 4+ ); ( Cu 1+ , Te 4+ );

( Al 1+ , Zr 5+ ); ( Ca 3+ , Co 6+ ); ( Cu 2+ , Sn 5+ );

( Al 3+ , Mg 6+ ); ( Ca 3+ , Y 6+ ); ( Zn 0+ , Y 3+ );

( Al 3+ , Cr 8+ ); ( Sc 1+ , C 3+ ); ( Zn 0+ , Pm 3+ );

( Si 1+ , Zn 3+ ); ( Sc 1+ , Te 4+ ); ( Zn 0+ , Gd 3+ );

( Si 1+ , Ce 4+ ); ( Ti 1+ , Mn 3+ ); ( Zn 0+ , Tb 3+ );

( Si 2+ , Na 4+ ); ( Ti 1+ , Ga 3+ ); ( Zn 1+ , Mo 4+ );

( Si 2+ , Cl 6+ ); ( Ti 1+ , As 3+ ); ( Zn 1+ , Pb 4+ );

( Si 3+ , Be 4+ ); ( Ti 1+ , Rh 3+ ); ( Zn 2+ , N 4+ );

( Si 5+ , N 6+ ); ( Ti 1+ , Tl 3+ ); ( Zn 2+ , Kr 5+ );

( Zn 3+ , N 5+ ); ( Y 5+ , Co 7+ ); ( Ce 1+ , Ho 3+ );

( Zn 5+ , Co 8+ ); ( Zr 1+ , Zr 3+ ); ( Ce 1+ , Er 3+ );

( Ga 1+ , Bi 4+ ); ( Zr 2+ , Sc 4+ ); ( Ce 1+ , Lu 3+ );

( Ge 1+ , S 3+ ); ( Zr 2+ , Sr 4+ ); ( Pr 1+ , Sc 3+ );

( Ge 1+ , Ce 4+ ); ( Nb 1+ , Mo 3+ ); ( Pr 1+ , Zr 3+ );

( As 1+ , Ca 3+ ); ( Nb 1+ , Sb 3+ ); ( Pr 1+ , Yb 3+ );

( As 1+ , Br 3+ ); ( Nb 1+ , Bi 3+ ); ( Nd 1+ , Nb 3+ );

( As 2+ , F 3+ ); ( Nb 2+ , Sn 4+ ); ( Nd 1+ , Hf 3+ );

( As 2+ , Kr 4+ ); ( Nb 2+ , Sb 4+ ); ( Pm 1+ , Nb 3+ );

( As 2+ , Nb 5+ ); ( Nb 3+ , Co 5+ ); ( Sm 1+ , Ti 3+ );

( Se 1+ , Zn 3+ ); ( Nb 3+ , Rb 5+ ); ( Eu 1+ , V 3+ );

( Se 1+ , Ce 4+ ); ( Nb 4+ , Zn 6+ ); ( Eu 1+ , Mo 3+ );

( Se 2+ , Kr 4+ ); ( Mo 1+ , Se 3+ ); ( Eu 1+ , Sb 3+ );

( Se 2+ , Nb 5+ ); ( Mo 1+ , I 3+ ); ( Gd 1+ , Bi 3+ );

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A1 cont.

( Se 3+ , Ni 5+ ); ( Mo 4+ , Fe 6+ ); ( Tb 1+ , Hf 3+ );
( Se 4+ , Nb 7+ ); ( Mo 5+ , Rb 8+ ); ( Dy 1+ , Ti 3+ );
( Br 0+ , Eu 3+ ); ( Ag 0+ , La 3+ ); ( Ho 1+ , Bi 3+ );
( Br 0+ , Tm 3+ ); ( Ag 0+ , Ce 3+ ); ( Er 1+ , Bi 3+ );
( Br 1+ , Nb 4+ ); ( Cd 0+ , La 3+ ); ( Tm 1+ , V 3+ );
( Br 1+ , Gd 4+ ); ( In 1+ , Nd 4+ ); ( Tm 1+ , Mo 3+ );
( Br 1+ , Ho 4+ ); ( In 1+ , Tb 4+ ); ( Tm 1+ , Sb 3+ );
( Br 1+ , Er 4+ ); ( Sn 1+ , Si 3+ ); ( Yb 1+ , Al 3+ );
( Br 2+ , F 3+ ); ( Sn 1+ , Co 3+ ); ( Yb 1+ , Ru 3+ );
( Br 2+ , Ga 4+ ); ( Sn 1+ , Ge 3+ ); ( Yb 1+ , In 3+ );
( Br 3+ , O 4+ ); ( Sn 2+ , F 3+ ); ( Yb 1+ , Sn 3+ );
( Br 3+ , Al 4+ ); ( Sn 2+ , Ga 4+ ); ( Lu 1+ , Tc 3+ );
( Br 4+ , N 5+ ); ( Sb 1+ , Si 3+ ); ( Lu 1+ , Ru 3+ );
( Kr 0+ , Ti 3+ ); ( Sb 1+ , Co 3+ ); ( Lu 1+ , In 3+ );
( Kr 1+ , Sn 4+ ); ( Sb 1+ , Ge 3+ ); ( Lu 1+ , Sn 3+ );
( Kr 1+ , Sb 4+ ); ( Sb 2+ , As 4+ ); ( Hf 1+ , Sc 3+ );
( Kr 2+ , Ne 3+ ); ( Te 1+ , Mn 3+ ); ( Hf 1+ , Yb 3+ );
( Kr 2+ , Bi 5+ ); ( Te 1+ , As 3+ ); ( Hg 0+ , La 3+ );
( Kr 3+ , O 4+ ); ( Te 1+ , Rh 3+ ); ( Pb 1+ , Ni 3+ );
( Kr 3+ , Al 4+ ); ( Te 1+ , Te 3+ ); ( Pb 1+ , Se 3+ );
( Kr 4+ , Ar 6+ ); ( Te 1+ , Tl 3+ ); ( Pb 2+ , F 3+ );
( Rb 0+ , Sc 3+ ); ( Te 2+ , Cr 4+ ); ( Pb 2+ , Ga 4+ );
( Rb 0+ , Zr 3+ ); ( Te 2+ , Ge 4+ ); ( Bi 1+ , P 3+ );
( Rb 0+ , Yb 3+ ); ( Te 2+ , As 4+ ); ( Bi 1+ , Sr 3+ );
( Rb 1+ , N 3+ ); ( Te 3+ , Zr 5+ ); ( La 1+ , Ru 3+ );
( Sr 1+ , C 3+ ); ( Te 4+ , Ni 6+ ); ( La 1+ , In 3+ );
( Sr 1+ , Ar 3+ ); ( Te 4+ , Cu 6+ ); ( La 1+ , Sn 3+ );
( Sr 1+ , Ti 4+ ); ( Xe 0+ , Pr 3+ ); ( Ce 1+ , Sm 3+ ); and
( Sr 1+ , Te 4+ ); ( Xe 0+ , Nd 3+ ); ( Ce 1+ , Dy 3+ ).
( Sr 3+ , Nb 6+ ); ( La 1+ , Tc 3+ );

296. A method of making a compound comprising reacting hydrino atoms to form dihydrino molecules and reacting said dihydrino molecules with at least one other element to form said compound.

297. A method of making a compound comprising reacting hydrino atoms with at least one other element to form said compound.

298. A method according to claim 297, further comprising reacting hydrino atoms with protons to form dihydrino molecular ions, and reacting said dihydrino molecular ions with said at least one other element to form said compound.

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